

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-12 are pending in this application. Claims 1 and 2 are amended and Claims 11 and 12 are added by the present amendment.

Amendments to the claims and new claims find support in the application as originally filed at least at Applicants' Figures 7 and 8 and in the specification at page 17, line 26, to page 18, line 5. Thus, no new matter is added.

In the outstanding Office Action, Claims 1-5 and 8 were rejected under 35 U.S.C. §102(b) as unpatentable over U.S. Publication 2002/0080816 to Spinar et al. (herein "Spinar") in view of U.S. Patent 6,986,156 to Rodriguez et al. (herein "Rodriguez"); Claims 6 and 7 were rejected under 35 U.S.C. §103(a) as unpatentable over Spinar and Rodriguez in view of U.S. Patent 6,078,568 to Wright et al. (herein "Wright"); and Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Spinar in view of U.S. Patent 6,785,252 to Zimmerman et al. (herein "Zimmerman").

Applicants respectfully traverse the rejection of Claims 1-5 and 8 under 35 U.S.C. §102(b) as unpatentable over Spinar in view of Rodriguez.

Claim 1 is directed to a station-side communicating apparatus that includes, in part, an allocation determining unit that determines a bandwidth allocation for each subscriber device in each data collection cycle, and a history managing unit. The history managing unit calculates a request increment as a difference between a received bandwidth request amount and the bandwidth allocation for each subscriber device. Further, the history managing unit stores a history of plural calculated request increments determined from more than one time of data collection and plural bandwidth allocations for each of the subscriber devices. Also, the history managing unit calculates a target bandwidth request amount by dividing the

received bandwidth request amount into the plural stored calculated request increments in the history, and the allocation determining unit determines the bandwidth allocation for each subscriber device based on the calculated target bandwidth request amount.

Applicants respectfully submit that Spinar and Rodriguez fail to teach or suggest each of the features of Claim 1. For example, it is respectfully submitted that the references fail to teach or suggest calculating a request increment as a difference between a bandwidth request amount and an allocation amount.

Spinar describes a method and system for adaptively obtaining bandwidth allocation requests and a broadband wireless communication system.¹ According to Spinar, polling may be adaptively adjusted in response to changes in parameters such as a history of previous use.² Spinar indicates that a polling policy module may establish zero polling for currently active users, may assign users having a range of usage history and QoS needs and guarantees to one or more polling groups to which multicast polls are made on a bandwidth-available basis.³ Moreover, Spinar indicates that the “bandwidth request processing module may take into account the available bandwidth of the channel, and may implement fairness algorithms (described elsewhere) to balance the bandwidth request and availability, thus providing adaptation and the granting of uplink bandwidth.”⁴ Thus, Spinar discusses taking into account an available bandwidth of a channel. However, Spinar is silent regarding any difference between a bandwidth request amount and a bandwidth allocation amount for a particular requestor. Accordingly, Spinar is silent regarding the calculation of a request increment as the difference between a bandwidth request amount and a bandwidth allocation amount. Furthermore, as noted in the Office Action, Spinar is silent regarding storing a

¹ Spinar at Abstract.

² Spinar at paragraph [0021].

³ Spinar at paragraph [0181].

⁴ Spinar at paragraph [0187].

history of calculated request increments each indicating a difference between a bandwidth request amount and a bandwidth allocation amount.

Accordingly, Applicants respectfully submit that Spinar fails to disclose or otherwise suggest a unit that “calculates a request increment as a difference between the received bandwidth request amount and the bandwidth allocation for the subscriber device, [and] stores a history of plural calculated request increments,” as required by Claim 1.

Additionally, Applicants respectfully traverse the assertion in the Office Action that Spinar paragraph 117 discloses dividing the bandwidth request amount into a plurality of request increments indicated by the history.⁵ The portion of Spinar cited in the Office Action merely states that “bandwidth allocation is possible by any ‘multiple access’ technique; that is, the shared medium may be divided according to time increments (TDMA), code division units (CDMA), or a combination of the two.” In other words, Spinar indicates that bandwidth allocation may be performed by allocating, or dividing up, the basic communication resources of the associated ‘multiple access’ technique (i.e., in the TDMA technique, the basic communication resource is a time increment, and in the CDMA technique, the basic communication resource is a code division unit). Thus, the cited portion of Spinar merely states that the units of bandwidth allocation may be selected as appropriate for the particular ‘multiple access’ technique in use. Therefore, Spinar describes that the units of bandwidth allocation may be time or code units, and Spinar is completely silent regarding calculating a target bandwidth allocation by dividing a received bandwidth request amount into plural request increments, where the request increments are determined based on a difference between an allocation amount and a bandwidth request amount.

Thus, Applicants respectfully submit that Spinar also fails to teach or suggest a unit that “calculates a target bandwidth request amount by dividing the received bandwidth

⁵ Office Action paragraph spanning pages 3 and 4.

request amount into the plural stored calculated request increments indicated by the history, wherein the allocation determining unit determines the bandwidth allocation for each of the subscriber devices based on the calculated target bandwidth request amount,” as required by Claim 1.

Rodriguez describes a system and method for adaptive scheduling and dynamic bandwidth resource allocation that dynamically assigns a content delivery mode to a plurality of digital transmission channels based on subscriber provided allocation criteria.⁶ In particular, Rodriguez indicates that a statistical model may be used by a bandwidth allocation manager to determine a bandwidth allocation schedule based on “analysis of the bandwidth consumption (or request from bandwidth) history of a significant number of subscribers over a significant period of time.”⁷ In other words, Rodriguez indicates that bandwidth allocation may be based on a history of bandwidth consumption (or request from bandwidth). Thus, Rodriguez merely indicates performing bandwidth allocation based on a history of bandwidth requests or bandwidth consumption. However, Rodriguez fails to mention or suggest any calculation of a request increment that is calculated as a difference between a received bandwidth request amount and an actual bandwidth allocation amount for a subscriber device. Further, Rodriguez fails to mention storing a history of plural of such calculated request increments. Accordingly, Applicants respectfully submit that Rodriguez fails to supply or suggest the claimed features lacking in the disclosure of Spinar.

Consequently, Applicants respectfully submit that Spinar and Rodriguez, whether taken individually or in combination, fail to teach or suggest a unit that “calculates a request increment as a difference between the received bandwidth request amount and the bandwidth allocation for each of the subscriber devices, [and] stores a history of plural calculated request increments,” as required by Claim 1. Also, it is respectfully submitted that Spinar

⁶ Rodriguez at Abstract.

⁷ Rodriguez at column 19, lines 6-11.

and Rodriguez fail to teach or suggest a unit that “calculates a target bandwidth request amount by dividing the received bandwidth request amount into the plural stored calculated request increments indicated by the history, wherein the allocation determining unit determines the bandwidth allocation for each of the subscriber devices based on the calculated target bandwidth request amount,” as required by Claim 1.

Therefore, Applicants respectfully submit that independent Claim 1 and the claims depending therefrom patentably define over Spinar and Rodriguez.

Additionally, Applicants respectfully traverse the rejection of Claim 2, and Applicants respectfully traverse the assertion in the Office Action that Spinar paragraph 92 discloses the features of Claim 2.⁸

Claim 2 is directed to the apparatus according to Claim 1, wherein the allocation determining unit determines a packet data size based on the request increments, and allocates a portion of the bandwidth request amount as the bandwidth allocation based on the determined packet data size.

The portion of Spinar cited in the Office Action indicates that “the user may be expressly directed to utilize a particular part of such slot, such as first, third, or last bandwidth unit within the contention slot. Such bandwidth units will vary with the architecture of the system, but may for example be a single PI (defined by the system coding scheme), or a minimum packet size.” In other words, Spinar indicates that a bandwidth unit may be selected to be a minimum packet size. Thus, Spinar indicates that a minimum packet size may be used as a bandwidth unit. However, Spinar is silent regarding a determining unit that *determines* what the packet data size is, or a determining unit that determines the packet data size based on a request increment, which is a difference between a received bandwidth request amount and a bandwidth allocation for a subscriber device.

⁸ Office Action at page 4, last paragraph.

Therefore, it is respectfully submitted that Claim 2 also patentably defines over Spinar for that distinct reason in addition to the reasons noted above with respect to independent Claim 1.

Therefore, Applicants respectfully request the rejection of Claims 1-5 and 8 under 35 U.S.C. §103(a) as unpatentable over Spinar and Rodriguez be withdrawn.

In addition, Applicants respectfully traverse the rejection of Claims 6 and 7 under 35 U.S.C. §103(a) as unpatentable over Spinar, Rodriguez, and Wright.

Claims 6 and 7 depend from independent Claim 1, which as discussed above is believed to patentably define over Spinar. Furthermore, Applicants respectfully submit that Wright fails to supply the claimed features lacking in the disclosure of Spinar and Rodriguez. Accordingly, it is respectfully requested the rejection of Claims 6 and 7 under 35 U.S.C. §103(a) also be withdrawn.

Furthermore, Applicants respectfully traverse the rejection of Claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over Spinar and Zimmerman.

Claim 9 is directed to a station side communicating apparatus that includes, in part, a history managing unit that determines a first non-allocation amount as a difference between a first bandwidth request from a subscriber device in a plurality of subscriber devices and a first allocation amount allocated in response to the first bandwidth request from the subscriber device. Additionally, the history managing unit determines a first request increment as a difference between a second bandwidth request and the first non-allocation amount. The apparatus of Claim 9 also includes an allocation determining unit that determines a third allocation amount for the subscriber device based on the first request increment, the second request increment, and a third bandwidth request from the subscriber device. Claim 10 is directed to a method including steps similar to the features of Claim 9 with a different scope of invention.

Applicants respectfully submit that Spinar fails to teach or suggest a unit that determines an allocation amount based on first and second request increments, which are differences between bandwidth request and non-allocation amounts, for reasons that are similar to those discussed above with respect to Claim 1.

Additionally, Applicants respectfully submit that Zimmerman fails to supply the features of Claim 9 lacking in the disclosure of Spinar, and Applicants respectfully traverse the assertion in the Office Action that those features are disclosed by Zimmerman column 3, lines 9-27 and 38-40.⁹

Zimmerman discusses a method and apparatus for a self-correcting bandwidth request/grant protocol that “utilizes a combination of incremental and aggregate bandwidth requests.”¹⁰ In particular, according to the cited portion of Zimmerman,

in accordance with incremental bandwidth request methods, a base station may allocate 1000 units of bandwidth to an associated CPE connection. At a later time, the CPE connection may require 1,500 units of aggregate bandwidth (i.e., it may require an additional 500 units of bandwidth). In accordance with the incremental bandwidth request/grant protocol, the CPE will transmit an incremental bandwidth request to its associated base station indicating that it requires an additional 500 units of bandwidth. Upon receiving the incremental bandwidth request, the base station calculates the CPE connection’s current aggregate bandwidth needs as 1500 units (1000 previously granted units + 500 requested units).

Thus, the “incremental bandwidth requests” of Zimmerman are very different than the presently claimed “request increments.” In particular, Zimmerman indicates that an incremental bandwidth request is an additional amount of bandwidth that is requested by a CPE, and the incremental bandwidth requests of Zimmerman identify an additional amount of bandwidth (e.g., 500 more bandwidth units in the example of the cited portion of Zimmerman) beyond a previously requested amount (e.g., 1000 previously requested bandwidth units in the example of the cited portion

⁹ Office Action at page 9, last paragraph to page 10, first paragraph.

¹⁰ Zimmerman at Abstract.

of Zimmerman). Thus, the incremental bandwidth requests of Zimmerman are not request increments that are based on a difference between a bandwidth request amount and a bandwidth allocation amount. Instead, the incremental bandwidth requests of Zimmerman are merely an additional requested amount beyond a previously requested amount.

Thus, Applicants respectfully submit that Spinar and Zimmerman fail to teach or suggest “a first non-allocation amount as a difference between a first bandwidth request from a subscriber device in the plurality of subscriber devices and a first allocation amount allocated in response to the first bandwidth request from the subscriber device, [and] a first request increment as a difference between a second bandwidth request from the subscriber and the first non-allocation amount,” as recited in Claim 9 and as similarly recited in Claim 10.

Therefore, Applicants respectfully request the rejection of Claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over Spinar and Zimmerman be withdrawn.

Additionally, Claims 11 and 12 are added to recite additional features similar to those of Claim 2. Therefore, Claims 11 and 12 are believed to patentably define over the cited references for distinct reasons similar to those discussed above with respect to Claim 2, in addition to the reasons discussed above with respect to the independent claims.

Accordingly, Applicants respectfully submit that independent Claims 1, 9, and 10, and claims depending therefrom, are allowable.

Consequently, in light of the above discussion and in view of the present amendment this application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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